

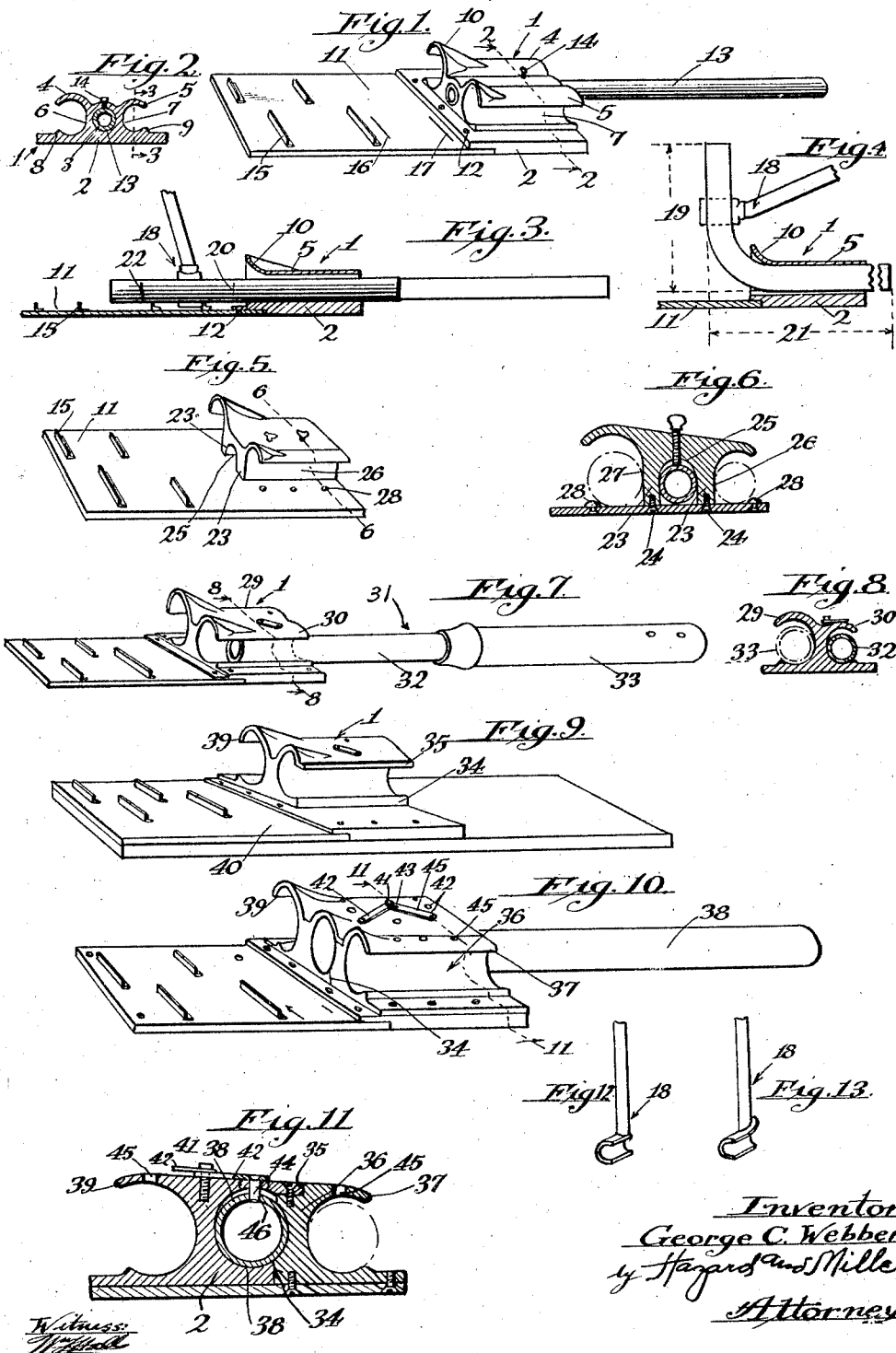
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PIPE BENDING APPARATUS

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UNITED STATES PATENT OFFICE.

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PIPE-BENDING APPARATUS.

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My invention is a pipe bending apparatus particularly adapted to bend more or less soft pipes such as electric conduits.

An object of my invention is a pipe bending apparatus particularly adapted for electric conduits or other pliable pipes in which the pipes are bent by hand.

A feature of my invention is utilizing stationary holders for the pipes, the free ends of the pipes being engaged by a bending device such as that known in the trade as a hickey and the bending being manually done by the hickey bending the pipes against the resistance of the stationary holding device.

Another feature of my invention is forming the holding device so that it may be clamped to a board or held by a rod and having in addition gage stops or the like on the plate to position the hickey, and bending marks marked on the plate to show the different positions for bending.

Another object of my invention is in making the holding device in sections so that it may be built up for different sizes of pipes.

My invention will be more readily understood from the following description and drawings, in which:

Fig. 1 is a perspective view of my bending device suitable for two sizes of pipes, with a leverage rod connected thereto;

Fig. 2 is a vertical cross section on the line 2—2 of Fig. 1, in the direction of the arrows;

Fig. 3 is a longitudinal section through Fig. 2 on the line 3—3;

Fig. 4 is a section similar to Fig. 3, showing the manner of bending the pipes;

Fig. 5 is a perspective view of a modified form of bending device which may be secured to a base plate;

Fig. 6 is a vertical section on the line 6—6 of Fig. 5;

Fig. 7 is a perspective view of another form of my device suitable for two sizes of pipes;

Fig. 8 is a vertical cross section on the line 8—8 of Fig. 7;

Fig. 9 is a perspective view of a form of my invention constructed to allow building up to different size pipes, this figure showing the construction for two sizes of pipes;

Fig. 10 is a view similar to Fig. 9 with an additional section attached thereto suitable for bending three sizes of pipes;

Fig. 11 is a vertical cross section on the line 11—11 of Fig. 10; and

Figs. 12 and 13 are views of two different types of bending implements or so-called hickies.

In the construction of Figs. 1 to 4 the pipe holder designated by the numeral 1 is constructed substantially as follows:

This is preferably made with a heavy base section 2 with a central core 3 and with longitudinally curved jaws 4 and 5 leaving side core sections 6 and 7 to fit two sizes of pipes. The base is preferably provided with longitudinal ridges 8 and 9 to retain the pipe in position and the mouth 10 of the pipe holder is belled as illustrated particularly in Figs. 3 and 4. The base is secured to the gage plate 11 by means of screws 12 or the like and a holding rod 13 shown as a pipe is fitted into the bore 3 and may be retained therein in proper adjustment by a pin 14 extending through registering apertures in the casting of the holding structure and an aperture in the holding rod.

The gage plate 11 is provided with gage stops 15 which are preferably small angles attached thereto by any suitable means and have gage marks 16 and 17 thereon to facilitate the operation in bending the pipes.

In the operation of bending pipes these are inserted from the sides through the open jaws into the cores 6 and 7 and the free end of the pipe is engaged by a bending device 18 such as known in the trade as a hickey, bending the pipe as illustrated in Fig. 4.

It is usual for the workmen to mark the pipes before bending in order that the various bent sections will conform to definite measurements. For instance, presuming the measurement 19 is required, that is, from the bent end of the pipe to the main section as shown in Fig. 4, the mark 20 on the pipe would be placed opposite the mark 17 on the gage plate and the pipe bent up on the desired curve. These curves may be made either of short or of long radius as desired, but are preferably bent to conform to the bell of the pipe.

When the measurement illustrated by the numeral 21 is to be made the workman will probably make a mark such as 22 on the pipe and position this opposite the mark 16. The hickey is then engaged against the proper stop gage 15 and the pipe bent upwardly giving substantially the exact measurement

required. These markings may if desired be ascertained by experiment and may differ according to the pipe used and the type of hickys utilized in bending same.

5 In the construction of Figs. 5 and 6 the holder is not provided with a base section but has downwardly extending longitudinal ribs 23 which are clamped to the gage plate by screws 24 or the like. This gives a central channel 25 for the holding rod and side channels 26 and 27 for the bending of the pipes. A series of rivets 28 through the base plate hold the pipe from rolling out of the bending jaws or the like.

15 In the modification of Figs. 7 and 8 the holder is provided with two jaws 29 and 30 for different size pipes and is clamped to the gage stop as above described. In this case the holding rod 31 is made of two different sizes, one end 32 being for holding in the smaller size jaws and the large end 33 for positioning the larger size jaws so that the respective large and small size pipes can be bent.

25 In the construction of Fig. 9 the holder is provided with two sets of jaws but in this case the end of the base is formed with an alining surface 34 and the upper jaw with an alining surface 35 so that the additional holder 36 may be placed thereagainst; this holder having clamping jaws 37 so that if desired three sizes of pipes may be handled in the jaw 37 and in the core 38 and also in the jaws 39, or if desired the center core 35 may be utilized for a holding or supporting rod.

It will be noted in Fig. 9 that the holder is illustrated as being bolted or the like to a board 40 and it is optional whether it be so held or be held by a supporting rod such as 13 and if desired moreover, the gage plate with the gage stops may be omitted, the workmen putting marks on the board or the like to guide in bending the pipes.

45 In the construction of Figs. 9, 10 and 11 I illustrate a quick adjustment for the holding rod in which a bolt 41 is secured in the holding device and has arms 42 swiveled thereon, these arms preferably having a slotted connection 43 and having pins 44 at the end. These pins extend down through apertures 45 in the block structure, forming the holding device and engage in apertures 46 in the supporting rod or pipe.

55 It will be seen from the above constructions that my invention may be considerably modified from a simple form of bender such as shown in Figs. 7 and 8 suitable for two sizes of pipes with the holding or supporting rod being engaged in one of the bending jaws, to that of Figs. 1 to 6 in which the holding rod is intended to fit in the central core or passage. There is also the further construction of Figs. 9, 10 and 11 in which the number of holding jaws may be increased

to accommodate several or more sizes of pipes or in which the central passage may be used for engaging the supporting rod while the two outside jaws are used for bending pipes.

It will thus be seen that my invention may be considerably changed in general construction and in specific details and may be further altered to suit different circumstances or requirements in the trade. Such changes however, would be within the spirit of my invention as set forth in the description, drawings and claims.

Having described my invention, what I claim is:

1. A pipe bending device comprising in combination, a pipe holder having a flat base to rest on a floor or the like, said holder having a longitudinal passage on one side and open at the side and with a belled mouth, means to secure the holder in position, and means to grip a pipe and bend same, the main body of the pipe being retained in the passage of the holder.

2. A bending device comprising in combination, a pipe holder having a flat base adapted to rest on a floor or the like, said holder having a plurality of longitudinal passages of different sizes on opposite sides and open at the sides, each having a belled mouth, means to secure the holder in position, and means to grip a pipe and bend same, the main body of the pipe being retained in a passage of the holder.

3. A bending device as claimed in claim 2, having in addition a rod having ends of different sizes to fit in either of the passages and thereby forming a means for steadying the holder while the pipe is being bent in another passage.

4. A bending device comprising in combination, a pipe holder having a flat base to rest on a floor or the like, a passage at the side, open at the side and having a belled mouth, and a core extending through the holder parallel to the passage, said core being adapted to receive a rod to steady the holder while a pipe is being bent in the passage.

5. A bending device comprising in combination, a pipe holder having a flat base adapted to sit on a floor, said holder having passages on the opposite sides and open at the sides, with belled mouths, said passages being of different sizes, and a gage plate secured to the holder adjacent the base and extending parallel to the passages, said plate having a plurality of gage stops extending upwardly from the plate.

6. In a pipe bending apparatus as claimed in claim 5, having a supporting rod adapted to fit in either of the passages and means to secure said rod therein.

7. In a pipe bending apparatus as claimed in claim 5, having an additional holder

forming a closure for the side of one of the passages and having a longitudinal open sided passage therein.

5 8. A pipe bender comprising in combination a pipe holder formed in a plurality of longitudinal sections, each of said sections having a jaw with a longitudinal passage at the side, and a central core
10 the core being adapted to receive a pipe to be bent or a holding rod.

9. A pipe bender as claimed in claim 8, one of the holders being provided with a series of apertures and removable pins
15 adapted for insertion therethrough, the pins being adapted to engage a supporting rod or the like.

10. A pipe bending apparatus comprising in combination a plurality of pipe holders
20 having a longitudinally abutting surface, each of said holders having a jaw at one side forming a longitudinal passage for pipes, said passages having belled mouths, one of said holders having a jaw closed at
25 the side by the other holder forming a lon-

gitudinal core with a belled mouth, the said passages and core being adapted to receive pipes to be bent.

11. A pipe bending apparatus as claimed in claim 10, one of said holders being provided with a bolt, arms swiveled to said bolt having pins, the holders having apertures therethrough, and the pins fitting in said apertures and being adapted to engage holding rods or the like.

12. A pipe bending apparatus comprising in combination, a bending structure having longitudinal passages at the sides and open at the sides, with belled mouths, said bending structure having a flat base adapted to rest on a floor, a gage plate secured to the holder adjacent the base and extending parallel to the passages, said plate having upturned angles forming gage stops, and in addition gage marks on the plate to indicate measurements for bending pipes.

In testimony whereof I have signed my name to this specification.

GEORGE CLIFFORD WEBBER.